White Company (White Motors Company)
E. 79th Street and St. Clair Avenue
Cuyahoga County
Cleveland
Ohio

Photographs and
Written and Historic Data

Historic American Engin eering Record
Heritage Conservation and Recreation Service
US Department of Interior
Washington, DC 20243

HAER, OH, 18-CLEV, 25C-

The White Sewing Machine Company
The White Company
The White Motor Company
HAER OH-11C

NAME: White Machine-Motor Company

LOCATION: Cleveland, Ohio

DATE OF SETTLEMENT: 1866

PRESENT OWNER: The White Motor Corporation

PRESENT USE: sheet-metal stamping, parts machining, and storage

SIGNIFICANCE: One of the nation's largest producers of steam automobiles; its plant one of the most modern in the world at the time. One of the few survivors of Cleveland's auto industry in the earliest stages.

HISTORIAN: Tom Fisher

The White Sewing Machine Company
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The White Motor Company

The White Company was one of the nation's largest producers of steam automobiles; its plant, "one of the most modern in the world."[1] The origins of The White Company lie in Phillipston, Massachusetts. There, Thomas White began experimenting with sewing machines in 1857. White patented his machine in 1859 and, in 1863, moved to Orange, Massachusetts to begin production.[2] Competition proved too great, forcing White and his co-worker, George Baker, to move to the expanding market of Cleveland in 1866. They founded The White Manufacturing Company on Canal Street in Cleveland's industrial flats.[3] The White Manufacturing Company later changed its name to The White Sewing Machine Company, becoming the nation's second largest sewing machine producer as well as a manufacturer of lathes, screw machines, kerosene lanterns, roller skates, bicycles, and phonographs.[4]

One of Thomas White's cons, Rollin White, graduated from Cornell's engineering school in the 1890's. In 1898, Rollin invented a flash boiler for powering steam automobile engines. Improving upon conventional tubular boilers which demanded a constant level of water, Rollin White's flash boiler used a closed system, turning water into steam within a helical coil of seamless tubing.[5] Rollin's Cornell professor called the flash boiler "a distinct discovery in the history of steam generation."[6] The patent for the flash boiler was approved in 1899.

By May, 1900, Rollin had made four working steam cars in a corner of his father's factory on Canal Street.[7] Called the Stanhope, after the 19th century two-passenger buggy, Rollin's Model A had a two-cylinder engine attached to a two-passenger buggy frame.

The White Sewing Machine Company merchandised the Stanhope with a production rate of three per week. In 1901, the company made its first automobile sale, gaining notoriety when it also won its first speed race at the Detroit Fair Grounds that year.[8] After that win, the company, unlike so many of its competitors, established a policy of "ignor(ing) stunt contests."[9] White wanted to emphasize the reliability and not the speed of steam cars by entering "only in competitions which proved the usefulness of the product."[10]

That policy did not hurt the White Stanhope sales. By 1903, the company had increased its rate of production to 20 cars per week for an annual total of 1000.[11] That same year, White opened sales and service departments in London, Boston, New York, Detroit and San Francisco.[12] In downtown Cleveland, it built a "garage and testing station ... a four-story building, 100 feet by 166 feet, fronting on Rockwell Avenue."[13]

A writer described the company's plant in 1903. "The factory buildings used exclusively for automobile building cover a floor space of fully 150,000 square feet ... The main factory is located on Canal Street, the wood-work of the frames and aluminum bodies

are made at a plant on Center Street, and the finishing of the bodies and final testing is done at the company's garage building, where the completed cars are turned over to local salesmen or made ready for shipping."[14] The narrow, wood-framed Canal Street plant was poorly lit and ventilated, with small double-hung windows overlooking a crowded industrial area. Despite those conditions, White managed to increase its production of automobiles each year. In addition, the company began marketing steam trucks in 1902 and steam buses in 1904.[15]

In 1905, the company's automobile production reached 1,500 per year. That prosperity motivated The White Sewing Machine Company's purchase of a site for a new automobile plant. The site encompassed 30 acres at the corner of E. 79th Street and St. Clair Avenue, south of the Lake Erie and Michigan Southern Railroad tracks and Cleveland's Gordon Park. The company hired Cleveland architect, George H. Smith, to design the factory, an unusual although not unwise decision, for Smith's reputation rested on his designs for Cleveland's two arcades and two of its major office buildings.

In November, 1906, the automobile department of The White Sewing Machine Company separated from the parent organization to form The White Company.[16] It had a capitalization of $2,500,000. Rollin White's older brother, Windsor became the company's president and his younger brother, Walter, its vice-president.

The new factory, completed in the early part of 1907, made

a significant departure from previous auto plant designs. Although it maintained the Winton plant's arrangement of separate departments on one level, the White factory placed them adjacent to one another under a single roof. And, while it employed the Baker plant's format of continuous saw-tooth skylights over the factory area, the White factory had a structure of iron columns and steel trusses to speed construction and improve fire protection.

The administration building and factory craneway were the plant's most influential features. George Smith originally designed the 220 foot by 90 foot administration building as a four-story reinforced concrete structure. The building's flat slabs spanned 19 feet and its reinforced concrete beams, 29 feet. Before construction began in June, 1907, Smith increased the building's height to six stories, the maximum height of concrete construction allowed by Cleveland's conservative building code. What got George Smith in trouble was not the building's height, but its spans. Cleveland's building inspectors stopped construction of the White administration building in November 1907 for "not conforming to the building code especially in regard to spans given in Title X section 21."[17] The architect and building commissioner remained at odds for ten months. The delay arose not out of Smith's ignorance but as his protest of the city's code restrictions on concrete design, a protest that had the support of many local architects and engineers. In

September, 1908, Commissioner William S. Lougee finally approved the building's design "on condition that tests as required by this department be made at expense of owner."[18] The administration building's 29 foot reinforced concrete spans cost The White Company an inconvenient delay and an extra $15,000. Yet, the "largest reinforced concrete building in Cleveland ... (with) spans ... the longest of any in the city," became a rallying poont for proponents of reinforced concrete design.[19]

The White factory's craneway had a more direct impact on automobile plant design. The company, formerly scattered in three factories, recognized that efficient materials handling would increase its production capacity without demanding an increase in plant size. As a result, George Smith designed a 600 foot by 30 foot craneway that linked the entire complex. With a sawtooth skylight 21 feet by 7 inches above its concrete floor, this central artery had an electric traveling crane and overhead doors allowing direct truck access to each department. On either side of the craneway, stairs gave access to second floor toilets and locker rooms.

Contemporary magazine articles called the craneway "one of the most decided novelties in factory construction," going into long descriptions of its design and use.[20] Its influence extended to The Ford Motor Company's famous Highland Park plant, then at the design stage in the office of Detroit architect Albert Kahn. Ford's biographer, Allen Nevins, stated that "Albert Kahn and the Ford Company construction engineer, Grey, ... profitted from

a study of earlier industrial buildings ... (such as) the big factory of the White Company in Cleveland ... (with its) striking... craneway running the ... length of the plant."[21]

An imaginative reworking of ordinary industrial details characterized the entire White plant. For example, the I-beam lower cords of the steel roof-trusses provided rails for moving chain hoists, housed coils for adjustable light fixtures, and held clamps for demountable currogated-metal partitions.[22] That imagination extended to White's labor relations. The company provided Americanization classes, a public and private library, recreational services, a free company magazine, and employee representation on the board of directors.[23]

Descriptions of the White factory's original layout exist.[24] The craneway connected four separate manufacturing wings. One 220 foot by 210 foot wing contained a 90 foot by 60 foot receiving department and stock room near the craneway's south end. That wing also contained a 160 foot by 90 foot frame and body building department next to a 220 foot by 120 foot body painting and varnishing department. North of that wing stood the administration building with its own entrance off of the craneway. North of the administration building stood another 220 foot by 210 foot wing with an engine and axle assembly department and a machine shop that occupied the entire space. Across the craneway from that wing stood a third 360 foot by 120 foot wing. It contained a variety of departments: a 120 foot by 60 foot blacksmith shop and case hardening department

with four gas-fired furnacea, a 120 foot by 30 foot polishing room, an 80 foot by 60 foot experimental shop, a 120 foot by 120 foot component painting department, and a 120 foot by 90 foot inapection department. Wouth of that structure stood a fourth wing, 220 feet long and 210 feet wide. It contained a 240 foot by 60 foot upholstery and trim department next to a 240 foot by 150 foot final assembly and testing room. Each wing had ita own baaement and outside elevator. Three of the basements were 210 feet long and 60 feet wide, the fourth being 270 feet long by 60 feet wide.

The White plant also contained a garage for the storage and repair of the trucks and carta used in the factory. It was 110 feet long and 44 feet wide with a central two-story space. At the back of the property, adjacent to the company's rail siding stood a 120 foot by 72 foot boiler house and engine room.

The boiler house contained a storage bin which received coal directly from railroad cars through a chute. An automatic chain grate stoker with buckets moving on an oval track delivered the coal to two Babcock and Wilsox 300-horsepower boilera. The adjoining engine room contained a 750-horsepower Erie compound engine which pumped ateam throughout the plant. Thia engine was also connected to a 500-kilowatt direct-current General Electric generator. Each wing of the plant had its own 50 kilowatt transformer to change the incoming current to a usable 110 voltage. In addition, some 60 electric motors, ranging from 5 to 50 horsepower, operated the

line shafting.

The movement of components within the plant occurred bilaterally. In other words, raw materials entered the craneway near its middle and moved south to the stock room and the body, paint, and trim departments or north to the foundry and machine shop. Completed sub-assemblies moved back down the craneway to the central assembly area. There, teams of eight men performed a single task on eight stationary vehicles, moving to another group of eight cars to perform a different operation. White's assembly method maintained the earlier teamwork approach in which each person could perform the entire assembly process. But the single task operations of workers at the White plant also for looked ahead to the moving assembly lines later developed by Henry Ford.

Inspectors tested the completed steam cars in a corner of the assembly room. They attached the car's rear wheels to a strap connected to a dynamo, measuring the power of the engine by its ability to light a bank of incandescent bulbs. After passing that test, the finished cars moved back to the craneway and out to the rail siding with its adjacent shipping building. The cars moved out of the White plant at a rate of 10 per day, having taken eight weeks to complete.

The architecture of the White factory had a remarkable consistency. Iron columns, 30 foot by 20 foot on center, supported 15 inch steel I-beams. These, in turn, supported steel sawtooth

Howe-trusses, 2 by 6 wood rafters, and a slate roof. The perimeter brick bearing walls had projecting buttresses defining the bays. Each bay had a stone-capped brick parapet with a saw-tooth profile; continuous stone lintels, sills, and watertable; and wooden double-hung windows with square proportions. Sheet metal ventilators with hooded louvers and wind vanes stood 60 feet apart along each roof slope.

The ends of the craneway and the factory garage featured double-story round arches with wide brick voussoirs and a corbeled cornice. The administration building, in contract to the factory proper, had a classically-inspired facade with a stone entrance portal, a rusticated brick base, pressed brick pilasters, and a stone beltcourse and cornice.

A nearly identical factory for The White Sewing Machine Company stood immediately south of The White Company's plant. Designed in 1909 by George H. Smith, the sewing machine factory repeated the single-story, steel-truss, sawtooth roof design and the central craneway organization. The factory had two wings, 330 foot by 220 foot and 330 foot by 250 foot, connected by a 330 foot by 20 foot monitor-roofed craneway. The building's St. Clair Avenue facade had wide brick arches and a corbeled cornice, later covered by a two-story office building and plant extension in 1916. In the 1920's that factory became the parts service department and the Cleveland service station for The White Motor Company.

When completed in 1907, the White plant was "forseen as becoming one of the largest sutomobile factories in the world," a cymbol of "the faith of the owners in the permanence of the automobile."[26] The company, however, lacked faith in the steam car. In 1906, it began experimenting with gasoline engines, producing a few gasoline automobiles the following year. In April, 1909, The White Company introduced a gas car on the market. By 1910, gasoline car production nearly equaled that of steam cars. The company produced 1,208 steam cars; 1,200 gasoline cars; and 80 gasoline trucks.[27] The plant capacity incressed by 14 vehicles per day, with 1,500 employees.[28]

The White Company produced its last steam car in January, 1911. That same year, it stepped-up its competition in the gasoline auto industry, marketing a new 4-cylinder engine and, in 1912, a new 6-cylinder engine.[29]

The company had high hopes for its gasoline cars, for it began a major plant expansion in 1912. In April of that year, The Raugh Construction Company completed George Smith's design for a new 200 foot by 60 foot steel-framed shipping building next to the boiler house. In February, 1913, the same contractor completed Smith's design for a 240 foot by 160 foot factory extension north of the case hardening department. In March, 1914, Raugh completed a 240 foot by 30 foot extension north of the craneway. Both additions maintained the architectural and structural format of the earlier plant.[30]

With the outbreak of World War I in Europe, The White Company ceased manufacturing automobiles and retooled for truck production. Its first order for 600 gasoline trucks came from the French army. The war brought prosperity to the company; its net earnings averaged $8,000,000.[31] On December 23, 1915, it reorganized as The White Motor Company with a capitalization of $16,000,000. The White Company remained as a sales and service subsidiary.[32]

At the same time, The White Motor Company changed architects, patronizing the engineering firm of Wilbur J. Watson and Company. In December, 1916, Watson finished plans for a 300 foot by 240 foot addition north of the machine shop. In the early part of 1918, Watson designed a 500 foot by 120 foot extension along the entire north end of the plant. Those additions followed George Smith's design except in their use of metal-framed windows and slightly larger sawtooth skylights.[33]

The year 1918 also marked the end of White's involvement in the Cleveland automobile industry. The company produced 18 gasoline cars as opposed to 12,150 trucks, finding the commercial vehicle more lucrative and less competitive than the auto industry. In January, 1919, The White Motor Company ended its automobile production altogether.[34] Within a few years, the company became one of the nation's largest truck manufacturers.

After 1919, the company began to alter the plant's architectural features and manufacturing arrangement. The company did

follow Smith's design for two 210 foot by 80 foot additions to the front of the factory in 1919. But, Wilbur Watson and Associates already had begun to develop a new structural format for the plant, featuring a continuous row of single-story steel-framed buildings with gabled roofs and monitor skylights enlcosing clear-span interior spaces. Watson's designs also called for the installation of moving assembly lines. In 1919, the company began constructing a frame asaembly and inspection building and a paint and final assembly building across the rail siding, west of the existing plant, using the original factory as a machine shop and for service and storage.[35]

Watson's 1919 additions became the first of a series of assembly buildings White constructed over a 45 year period, enlarging the plant to its present size of 214,157 square meters. Nevertheless, the factory still contains an original Babcock and Wilcox boiler and some of its original line shafting andmotors. The White Motor Corporation now uses the plant for sheet-metal stamping, parts machining, and storage. Its assembly line and much of the factory's machinery has been moved to newer facilities.

White's history parallels that of The Baker Motor Vehicle Company. Both arose out of the same sewing machine company. Both produced cars made obsolete by gasoline automobiles. And, both used World War I as an opportunity to establish themselves in the less competitive commercial vehicle field. Still manufacturing vehicles, the two companiea stand among the few survivors of Cleveland's early automobile industry.

(White) Footnotes

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2. Fred Kingsbury, Auto Editor, "Big White Plant has Long History," Cleveland Plain Dealer, March 15, 1925, p 4D.
3. Ibid.
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6. Henry H. Hower, "In Ten Years, Cleveland has Developed Automobile Making from an Insignificant Fad to a Great Industry," Cleveland Plain Dealer, June 7, 1909, p 3D.
7. James Rood Dolittle, ed., The Romance of the Automobile Industry, The Klebold Press, New York, 1916, p 32.
8. Wager, Golden Wheels, p 53.
9. Kingsbury, "White Plant," Plain Dealer, 1925, p 4D.
10. Ibid.
11. Wager, Golden Wheels, p 53.
12. Ibid., p 54.
13. "Cleveland's Motor Vehicle Activities," The Automobile, October 3, 1903, pp 324, 337.
14. Ibid., p 336-337.
15. Kingsbury, "White Plant," Plain Dealer, 1925, p 4D.
16. Wager, Golden Wheels, p 60.
17. Cleveland Building Permits, Cleveland City Hall.
18. Ibid.
19. "The Reaugh Construction Company," The Ohio Architect, Engineer, and Builder, Cleveland, June 1915, p 36.
20. "In the Making of a Steam Car," The Automobile, September 19, 1907, p 401.
21. Allan Nevins and Frank Ernest Hill, Ford, The Time, The Man, The Company, Charles Scribner's Sons, New York, 1954, p 454 fn.
22. Robert I. Clegg, "An Example of Recent Factory Construction," The Iron Age, May 2, 1907, p 1329-1335.
23. Fred H. Colvin, "Increasing Production without a Bonus," American Machinist, April 22, 1920, p 869-871; May 13, 1920, p 1041-1043.
24. Clegg, "An Example," Iron Age, 1907, p 1329-1335; "Making a Steam Car," Automobile, 1907, p 401-402.
25. The White Motor Company, The White Book, June 1925. pp 58-59.
26. Wager, Golden Wheels, pp 60, 61.
27. Ibid., p 63.
28. Ibid., p 64.
29. Ibid., p 65.

30. Cleveland Building Permits, Cleveland City Hall.
31. Wager, Golden Wheels, pp 66, 68.
32. Ibid., p 68.
33. Cleveland Building Permits, Cleveland City Hall.
34. Wager, Golden Wheels, p 69.
35. Cleveland Building Permits, Cleveland City Hall.

Addendum to

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HAER No. OH-11C

PHOTOGRAPHS

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